

WHAT IS CLAIMED IS:

- 1 1. A surgical apparatus, comprising:
2 a surgical instrument including a housing and a cannula, and the cannula
3 attached at a proximal end to the housing and defining at a distal end thereof an
4 opening and the housing containing a drive interface; and
5 a surgical tool including a shaft and a tip, and the tip located in the opening,
6 and the shaft contained within the cannula and the shaft mechanically and electrically
7 coupled at a distal end to the tip, and at a proximal end, to the drive interface and an
8 electrical interface, and the drive interface producing a surgical motion of the tip, and
9 the electrical interface producing a cauterizing action of the tip.
- 1 2. The surgical apparatus of claim 1, wherein the surgical instrument further
2 comprises:
3 a first electrical member suitable for switchable coupling to a power supply;
4 and
5 wherein the surgical tool further comprises;
6 a second electrical member, located at the proximal end of the shaft and
7 electrically coupling the first electrical member to the shaft to form the electrical
8 interface.
- 1 3. The surgical apparatus of claim 2, wherein the first electrical member further
2 comprises a switch, located on the housing.
- 1 4. The surgical apparatus of claim 2, wherein the surgical instrument further
2 comprises:
3 an interconnector including the first electrical member, and the interconnector
4 located between the housing and the cannula for coupling the housing and the
5 cannula.

1 5. The surgical apparatus of claim 2, wherein the first electrical member includes
2 a brush and the second electrical member includes a commutator electrically coupled
3 to the shaft.

1 6. The surgical apparatus of claim 2, wherein the second electrical member
2 includes the proximal end of the shaft.

1 7. The surgical apparatus of claim 1, wherein the tip includes at least one
2 conducting portion and at least one non-conducting portion, and wherein the shaft is
3 electrically coupled to the at least one conducting portion.

1 8. The surgical apparatus of claim 7, wherein the at least one conducting portion
2 defines at least one exposed convex tip surface and the non-conducting portion
3 defines at least one concave tip surface.

1 9. The surgical apparatus of claim 7, wherein the at least one conducting portion
2 defines at least one exposed concave tip surface and the non-conducting portion
3 defines at least one convex tip surface.

1 10. The surgical apparatus of claim 7, wherein the at least one non-conducting
2 portion defines a first exposed surface of the tip, and the at least one conducting
3 portion extends from at least one location internal to the tip through the at least one
4 non-conducting portion to define a second exposed surface of the tip.

1 11. The surgical apparatus of claim 10, wherein the at least one conducting portion
2 extends from a single location internal to the tip.

1 12. The surgical apparatus of claim 10, wherein the at least one conducting portion
2 extends from multiple locations internal to the tip.

1 13. The surgical apparatus of claim 10, wherein the at least one conducting portion
2 extends at an angle to a longitudinal axis of the tip to define at least one disk.

1 14. The surgical apparatus of Claim 10, wherein the second exposed surface
2 extends in a diametric arc about a longitudinal axis of the tip.

1 15. The surgical apparatus of Claim 10, wherein the second exposed surface
2 extends in an arc along a longitudinal axis of the tip.

1 16. The surgical apparatus of Claim 10, wherein the second exposed surface
2 defines at least one point source.

1 17. The surgical apparatus of claim 10, wherein the second exposed surface
2 defines at least one cutting edge of the tip.

1 18. The surgical apparatus of claim 1, wherein a substantial portion of a surface of
2 the shaft is conductive, thus forming an electrical coupling between the electrical
3 interface and the tip.

1 19. The surgical apparatus of claim 1, wherein a substantial portion of a surface of
2 the shaft is non-conductive, and a portion of the shaft, running along a longitudinal
3 axis of the shaft, is conductive, thus forming an electrical coupling between the
4 electrical interface and the tip.

1 20. A cutting and cauterizing device for connection to a surgical instrument, and
2 the surgical instrument including a drive interface and a first interconnector, and the
3 cutting and cauterizing device comprising:
4 a cannula defining at a distal end thereof an opening;
5 a second interconnector, suitable for switchably coupling to a power supply,
6 and the second interconnector located at the proximal end of the cannula and shaped
7 to couple to the first interconnector; and
8 a surgical tool including a shaft and a tip, and the tip located in the opening,
9 and the shaft contained within the cannula, and the shaft coupled at a distal end to the
10 tip and at a proximal end mechanically coupled to the drive interface to permit a
11 surgical motion of the tip, and electrically coupled to the second interconnector to
12 permit a cauterizing action of the tip.

1 21. The cutting and cauterizing device of claim 20, wherein the second
2 interconnector further comprises:
3 a first electrical member suitable for switchably coupling to the power supply;
4 and
5 wherein the surgical tool further comprises:
6 a second electrical member, located at the proximal end of the shaft and
7 electrically coupling the first electrical member to the shaft.

1 22. The cutting and cauterizing device of claim 21, wherein the first electrical
2 member includes a brush and the second electrical member includes a commutator
3 electrically coupled to the shaft.

1 23. The cutting and cauterizing device of claim 21, wherein the second electrical
2 member includes the proximal end of the shaft.

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1 24. The cutting and cauterizing device of claim 20, wherein the tip includes at
2 least one conducting portion and at least one non-conducting portion, and wherein the
3 shaft is electrically coupled to the at least one conducting portion.

1 25. The cutting and cauterizing device of claim 24, wherein the at least one
2 conducting portion defines at least one exposed convex tip surface and the non-
3 conducting portion defines at least one concave tip surface.

1 26. The cutting and cauterizing device of claim 24, wherein the at least one
2 conducting portion defines at least one exposed concave tip surface and the non-
3 conducting portion defines at least one convex tip surface.

1 27. The cutting and cauterizing device of claim 24, wherein the at least one non-
2 conducting portion defines a first exposed surface of the tip, and the at least one
3 conducting portion extends from at least one location internal to the tip through the at
4 least one non-conducting portion to define a second exposed surface of the tip.

1 28. The cutting and cauterizing device of claim 27, wherein the at least one
2 conducting portion extends from a single location internal to the tip.

1 29. The cutting and cauterizing device of claim 27, wherein the at least one
2 conducting portion extends from multiple locations internal to the tip.

1 30. The cutting and cauterizing device of claim 27, wherein the at least one
2 conducting portion extends at an angle to a longitudinal axis of the tip to define at
3 least one disk.

- 1 31. The cutting and cauterizing device of claim 27, wherein the second exposed
2 surface extends in a diametrical arc about a longitudinal axis of the tip.
- 1 32. The cutting and cauterizing device of claim 27, wherein the second exposed
2 surface extends in an arc along a longitudinal axis of the tip.
- 1 33. The cutting and cauterizing device of claim 27, wherein the second exposed
2 surface defines at least one point source.
- 1 34. The cutting and cauterizing device of claim 27, wherein the second exposed
2 surface defines at least one cutting edge of the tip.
- 1 35. The cutting and cauterizing device of claim 1, wherein a substantial portion of
2 a surface of the shaft is conductive, thus forming an electrical coupling between the
3 electrical interface and the tip.
- 1 36. The cutting and cauterizing device of claim 1, wherein a substantial portion of
2 a surface of the shaft is non-conductive, and a portion of the shaft, running along a
3 longitudinal axis of the shaft, is conductive, thus forming an electrical coupling
4 between the electrical interface and the tip.
- 1 37. A method of performing a surgical procedure, comprising using the surgical
2 apparatus of claim 1 in the course of performing the surgical procedure.
- 1 38. A method of performing a surgical procedure, comprising using the cutting
2 and cauterizing device of claim 20 in the course of performing the surgical procedure.